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ON THE

ANTIDOTAL TREATMENT

OF THE

EPIDEMIC CHOLERA.

BY JOHN PARKIN, M.D.,

HONORARY FELLOW OF THE ROYAL ACADEMIES OF MEDICINE AND SURGERY IN MADRID, BARCELONA AND CADIZ; CORRESPONDING MEMBER OF THE MEDICAL SOCIETY OF BARCELONA; AND OF THE ROYAL PELORITAN SOCIETY, MESSINA; FELLOW OF THE ROYAL MEDICAL AND CHIRURGICAL SOCIETY OF LONDON, ETC., ETC.

"La seule méthode prophylactique rationnelle et vraiment efficace, consisterait, soit à éloigner la cause *spéciale* de l'épidémie; soit, du moins, à mettre en œuvre des moyens qui neutraliseraient incessamment l'action de cette cause.

Bouillaud; Traité du Cholera Morbus de Paris.

LONDON:

WILLIAM H. ALLEN, LEADENHALL STREET;

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1846.

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TO

SIR RICHARD DOBSON, M.D.,

ETC., ETC.

My Dear Sir

You did me the favour to take under your kind protection, the former Edition of the present work. I am, therefore, emboldened to request you to perform the same act of kindness on the present occasion, and thus add another obligation to the number that have been already bestowed upon me—the remembrance of which will always be, I can assure you, a source no less of pride than of gratification.

I am,

Your very obliged Servant,

And former Pupil,

J. PARKIN

London; July 1*st*, 1846.

PREFACE.

THE re-appearance of the Epidemic Cholera, on the confines of Europe, and the general expectation which exists, that it may again visit this country—an opinion rendered more than probable at the present moment—have induced me to prepare, somewhat hastily, another and more condensed edition of a former work of mine on the same subject—feeling it to be a duty incumbent on me to give every individual an opportunity of testing the efficacy of a plan of treatment which has claims on the attention of the profession, higher, in my opinion, than any other which has yet been proposed; for I am not aware that any evidence has been advanced which tends to show, that, independently of the remedy now pointed out, a SPECIFIC for the Epidemic Cholera has either been employed or discovered.—That the remedy here alluded to is one of this class, I cannot entertain the slightest doubt; while also I would hope that the evidence, now brought forward, will convince the majority of

my readers of the justness of this conclusion; and thus afford them the hope and consolation that, hereafter, the Epidemic Cholera may become as amenable to medical treatment as the majority of diseases,—should it not appear that it is actually more so.

Not only am I firmly convinced, myself, that there is a certain and safe remedy for the Epidemic Cholera; but, I am equally sure that all those, who have given the medicine here pointed out a fair and proper trial, must have come to the same conclusion.—As, however, when this agent was first proposed to the profession, as well as at various periods since, many persons have doubted the possibility of its being a *specific;* and have not only refused to test its efficacy, but have even attempted to prevent other practitioners from placing that reliance on it which I do myself, it would seem right, in this place, to offer some remarks in reply to these medical sceptics.

Some individuals have said, it is utterly impossible that so simple a remedy can cure so dreadful a disease—one that has baffled the united skill of the profession in this and every other country. To this I would reply, that it is this very circumstance which ought, in my opinion, to command attention; for it may be confidently said that in the treatment of diseases, as well as in many other sciences, "Simplicity is the perfection of Art."

If, however, by simple, they mean *single*, I would answer that nature produces the most im-

portant results by means, apparently, the most simple,—never employing *two* agents when one will suffice.—We may therefore conclude that, in the production of disease, as well as in all her other operations, the same rule is observed; while I may add, such an inference is confirmed by the fact that certain diseases are known to be produced by a single, or specific cause. If, therefore, the *cause* be single, why should not the *remedy* be single also? Were *nature* the physician, such, doubtless, would be the case, for we may be sure that *she* would never employ *two* remedies to remove a disease, produced by a single, or specific agent. Nor should *we*, unless from ignorance, or from an inability to obtain, by a single remedy, the result that we seek for—sometimes successfully, and sometimes fruitlessly—by the employment of a number.

But this agent, after all, is not so inoperative as many suppose, but is endowed with most important chemical properties. It not only renders innocuous putrefactive and other matters, injurious to animal life; but it will actually preserve meat, and other articles, excluded from the contact of the external air, untainted, for centuries—as long, in fact, as we can prevent the escape of the antiseptic gas. Can such an agent, therefore, be a simple one, or unlikely to be attended, I would ask, with beneficial results? especially when compared with the greater number of those employed in the treatment of disease; and which, so far from being possessed of antidotal properties, may themselves be

placed among one or other of the different classes of poisons.

Under the idea that this agent is a simple one, and totally inadequate to the production of such results, another individual has asked, is it not infinitely more probable that the particular epidemic, treated with such happy results, by the Spanish physicians, was one naturally mild and tractable—one that would have yielded to the remedial powers of nature—than that *the terrible* cholera, which produced such havoc in this country, could have been subdued by *a few saline draughts?* In answer to this, I would observe, in the first place, that my own experience in the effects of this remedy has not been confined to Spain, but was founded on the result of the treatment of the disease in this country; while, also, it was in consequence of the benefit then obtained, that I was induced to address circulars, on the subsidence of the disease in London in 1832, to the different Boards of Health, and the majority of the practitioners, in those towns in which it subsequently appeared—in this country, in Ireland, in Scotland, in America, and Canada. Not only was I induced to adopt this course, in order to make known, as widely as possible, my opinions on this subject; but I also formed the resolution, on the appearance of the epidemic in Spain, of passing over to that country—with the express object of demonstrating, to the profession there, the effects of Carbonic acid gas.

I am, therefore, enabled to state from my own

observation, as well as from statistical facts, that in no country in Europe, if we except the fatal irruption at Paris, was the epidemic more severe, or its ravages greater, than in Spain—an opinion already expressed by me in my former work.* But, independently of individual opinions and statistical facts, the reviewer ought to have known that the difference in the mortality in different countries—possessing the same physical qualities or temperature—has not arisen so much from a variation in the type of the disease as from the greater or less extent of its ravages, *geographically*

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* In Valencia, where the treatment now under discussion was *not* adopted, except in a few solitary cases, as I did not arrive there until the subsidence of the epidemic, the mortality amounted to 6,000, out of a population of about 50,000, the remainder having fled on the outbreak of the malady. This amount is nearly one-third more than the number of deaths in London, with a population—a resident population—of a million. In Barcelona, again, where the administration of the remedy now proposed by me was commenced, shortly before the epidemic had arrived at its height, and when from 100 to 200 were dying daily, the mortality was calculated at from 3,000 to 4,000, out of a population, then remaining in the town, of about 70,000. At Mataro, it is true, the mortality was very low—not more than a twelfth of the number attacked—but then, was this to be ascribed to the mildness of the Epidemic, or the superiority of the treatment adopted? If any faith is to be placed in the report of Dr. Pasqual, added in the Appendix, we must ascribe it to the latter; while, also, I may add that in the neighbouring towns, attacked at the same time, the disease appeared to have lost nothing of its intensity or virulence—at least, if we are to judge by the *proportion* of deaths. Thus, at Suria, two-thirds of those attacked died; while at Manresa, a village between Barcelona and Mataro, and which was invaded by the disease shortly before the latter, *the whole* of the cases proved fatal. I would only further remark, that in these towns the treatment recommended by me was *not* adopted.

considered. Thus, although the mortality was so small in London, when compared with other places, the cause was not to be ascribed to the mildness of the epidemic, or the superiority of the treatment adopted, but solely to the limitation of range of the morbific cause—the ravages of the disease being principally confined to particular parts of the town, particular streets, or particular houses; while it was also shown that *the number of deaths to the number attacked,* was the same as in other countries of Europe, viz. about one half.

Again; the reviewer supposes that the patients in Spain, treated by this particular method, might have recovered by the remedial powers of Nature; instead of by the efforts of art. This conclusion, however, is contrary to all experience; for not only must we attribute every case of recovery *entirely* to the efforts of art; but we must also, with the writer of the Madras Report, consider *death* as the ordinary termination of cholera. In fact it is on record that, in India and elsewhere, when the population was without medical aid, *every person* attacked *died.*

Although, therefore, we must conclude that every case of recovery from an attack of cholera, is due to the efforts of art; and although there can be no doubt that the premonitory diarrhœa is an effect of the same cause as that which produces the severe form; still, I would never wish to rest the question of the efficacy of the remedy I have proposed, on the results obtained by its

administration in slight cases, or in the first stages of the disease—as has been most erroneously supposed. On the contrary, I am not only willing but *anxious* to rest the claim which the medicine has to the attention of the Profession, *solely and entirely on its effects at the commencement of the stage of collapse*—at that period, be it observed, when there can be no question as to the nature of the disease; its type; or the result, when unchecked by the efforts of art,—for cholera, in the stage of collapse, is cholera, whether it be observed on the banks of the Ganges, the banks of the Thames, or the coast of Spain. Now it will be apparent, from the arguments hereafter used, when considering the *modus operandi* of the remedy, as well as from the reports of other practitioners, that the efficacy of the medicine, to quote the language of the writers of these reports, is *most visible* at the commencement of collapse; and that, in such cases, it acts *miraculously!* What, therefore, I would recommend, to those who are anxious to give the remedy a fair and proper trial, is to have recourse to it, at first, in those cases in which *symptoms of collapse* have manifested themselves, and more particularly that most characteristic of all symptoms —the blueness.* This was the course usually pur-

* But it is necessary, in order that the trial may be a fair one, to select cases in which no medicine has been previously given; while, also, it is equally necessary to abstain from the administration of all other remedies, until the result is ascertained, as, otherwise, we may be counteracting the beneficial operation of the one under observation by giving those of an opposite tendency. For instance, I have known the

sued by the Spanish physicians; and it was this circumstance which enabled them to speak, with so much confidence, respecting the plan of treatment then recommended for their adoption, and its superiority over every other tried by them.

Had the same course been adopted by those practitioners to whom my circulars were addressed, a very different result would doubtless have been obtained—for although, as I shall have occasion to remark hereafter, the remedy then proposed by me came to be more and more generally adopted, particularly in those districts visited by the disease after its subsidence in London; and although I can state, from a comparison of the reports sent in to the Central Board of health, that the most successful practice appeared to be that to which Carbonic acid gas had been added, in some form or other, the evidence derived from this source is principally indirect.

This circumstance is, perhaps, to be accounted for from the fact, that, in my circular to the Boards of Health, as well as in the papers subsequently published in the "London Medical and Surgical Journal," I did not advise the exclusive use of Carbon or Carbonic acid. On the contrary, after giving a slight sketch of the theory I entertained respect-

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vomiting and purging reproduced by the exhibition of the saline medicines of Dr. Stevens, after these symptoms had been removed by the administration of carbonic acid gas. The same remarks will also apply to a variety of other remedies that have been employed in the Epidemic Cholera.

ing the antidotal properties of this substance, I attempted to explain the *modus operandi* of various medicines resorted to in this disease, as emetics, purgatives, mercury, &c.; and added, that they might, adminstered in a proper manner, be found useful and powerful adjuvants. Not having then had the same extended experience in the use of the remedy as at present; I did not feel justified in recommending others to deprive their patients of what might be considered the slightest chance—in a disease so rapid in its course and so fatal in its termination as that of Cholera Asphyxia.

In addition to this, the treatment pursued in England for the generality of diseases, is a complicated one; in which we are accustomed to employ a variety or number of remedies at the same time, or in combination,—for reasons that I have attempted to explain when comparing the practice of medicine in Spain with that in this country.* That the same rule should have been observed in the Epidemic Cholera, is therefore not to be wondered at, especially as every thing connected with the treatment of the disease was at that time doubt and conjecture; and when, as was quaintly remarked by one writer, what appeared to be a remedy in the Borough, was no remedy in Whitechapel; and what was useful in Whitechapel, was useless in St. Giles.

Still, although the actual amount of evidence

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* Vide Lancet, May 12th and 19th, 1838.

derived from these sources was comparatively small, it would, even without my own experience, have been sufficient to have established my proposition, had I been obliged to rely upon it. Thanks, however, to the liberality and kindness, or, rather, I should say, humanity of the Spanish physicians (for the question is not an individual one) so much more direct, and therefore more valuable, proof has now been obtained, that it is unnecessary for me to depend upon other, or less doubtful evidence. In fact, I not only indulge the hope, that every individual who peruses this work, and weighs the evidence now advanced, will be induced to give this remedy a fair and proper trial, whenever the opportunity may present itself; but I feel confident that those individuals, be they whom they may, will resort to this chemical agent again, and will continue to employ it afterwards, in every case and during every stage of the disease; and, if not to the exclusion of all other remedies, at least to their limitation, to the extent pointed out in this work.

But then it will be necessary to resort to the remedy at *the commencement* of collapse, and not when it has become confirmed, for, although it would seem to be the height of folly to expect to witness the same results from this, or any other remedy, when only resorted to in the last stage of the disease, the cry—the universal cry—of medical men, from the first outbreak of the malady to the present day, has been—Give us a remedy for the state of

confirmed collapse, it is *that* which we most require. With pain be it spoken, we have required in thousands, nay millions of instances such a remedy, and, what is more, we want it still. When the question has been put to me—and it has generally been one of the first—is Carbon a remedy for the collapsed stage of Cholera? my answer has been—No, it is not a remedy *for* collapse, but a remedy *to prevent* collapse. This is a distinction which ought always to be borne in mind; as it is certain that this particular state would seldom be witnessed, did we possess the means of arresting the progress of the disease in its first stages; for how rarely it happens, except in situations where the population is without sufficient aid, that a patient arrives at the state of complete collapse, before the commencement of medical treatment. If so, and if we possess a certain remedy for the Epidemic Cholera, in its first stages (as I shall attempt to show in this work is the fact) few, or no cases of collapse would be witnessed—provided that this particular remedy were resorted to in time.*

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* As an example, I may refer to the official lists at Valencia, by which it appears, that, out of 5,115 attacked, 3,582 were slight cases when first seen. Now I am bold enough to affirm, that nearly all these cases, or *ninety-nine out of every hundred*, would have recovered by the adoption of the plan of treatment I have proposed. If, also, we allow that one-half of the severe cases might have recovered by the employment of the same remedy—and which a reference to the reports added in the Appendix will show is not too high an estimate—instead of 3,854, the actual amount, the number of deaths would not have been more than 800.

If, however, medical men, either from confidence in their own measures or from any other cause, refuse to resort to this remedy, until the state of complete and confirmed collapse — when the blood has ceased to circulate in the body, perhaps, for hours; when absorption is utterly impossible; and when liquids, poured into the stomach, fall as into an inert vase—they have an undoubted right to do so; but they will have no right to say, afterwards, that they have given the remedy a fair and proper trial; for such a trial would not only be useless in itself, but an injustice to me, and the means of preventing; as far as they are individually concerned, the solution of a problem that has hitherto baffled the skill and the talent of the whole medical world; and in which the greater part, if not the whole human race, is more or less deeply interested.

CHOLERA.

SYMPTOMS.

As this disease is now, unfortunately, so well known, it would be superfluous to enumerate the symptoms by which it is characterised. It is necessary, however, to remark, for the perfect understanding of the observations about to be made, that I divide the Epidemic Cholera into two distinct and different forms—the mild, which has received the generic name of Cholerine—and the severe, that of Cholera Asphyxia, or Blue Cholera. The latter, which alone forms the subject of the present work, I have subdivided into four different periods.

The premonitory,* or preliminary Diarrhœa, so common and general a precursor of the other periods, forms, with me, the first stage of this disease. Again, that peculiar affection of the stomach, cha-

* Premonitory, as Mr. Greenhow has remarked, is an erroneous term;—it is not a premonition of the disease, but a concatenation of circumstances constituting the early period of the disease itself.

racterised by *malaise*, giddiness, faintness, nausea and vomiting of the contents of this organ—which sometimes precedes the diarrhœa, but more generally follows it, and ushers in the next stage; and which forms, in those cases wherein the preliminary diarrhœa is wanting, the first link in the chain of morbid symptoms—I have also placed in the same division.

I designate, as the second stage of the disease, that period of the attack when a fluid resembling *congee*, rice or barley-water, is thrown up from the stomach, or evacuated from the bowels. Spasm may, or may not, be present at the same time, but the pulse is little, if at all, affected.

The state of collapse constitutes the third, and, in certain localities, as India, the last stage of the disease; while, in others, as cold climates, another stage is superadded, characterised by symptoms the reverse of the former—being a state of excitement, or fever—and hence termed the consecutive fever. This, therefore, when it occurs, forms the fourth and last stage of the disease.

This is the order which is observed under ordinary circumstances; but, in other instances, Cholera, like the majority of diseases, has presented a great and striking variation—not so much in individual cases, however, as in particular places or particular visitations. Thus, when the disease appears epidemically in a town, or district, or in the camp of an army, it may, on one occasion observes the writer of the Madras Report, be distinguished,

throughout, by the absence of vomiting, and the prevalence of purging; on another occasion, by the excess of vomiting, and, though more rarely, by the absence of purging. Spasm may be generally present in one instance of invasion; in another, it may not be distinguishable. A frequent variety, the worst of all, is that which is noted for the very slight commotion in the system; in which there is no vomiting, hardly any purging; perhaps only one or two loose stools; no perceptible spasm; no pain of any kind; a mortal coldness, with arrest of the circulation, comes on from the beginning, and the patient dies without a struggle.

CAUSE.

When we observe the symptoms which this singular malady presents, and compare them with those produced from various poisonous substances, more particularly septic ones; when those deductions are drawn, which are allowable from the result of various methods of treatment; and when, as has been remarked by one writer,* all other theories, which have yet been broached on the subject, are insufficient to account for the morbid phenomena presented: the conclusion, that this disease is produced by the operation of a poison on the system, would seem as capable of proof as a mathematical proposition.

As, also, a number of persons, no matter whether congregated in the same place or not, are always attacked simultaneously, we must infer that the cause is a general one; and that the poison is generated *without* and not *within* the body. Although it is immaterial, in a practical point of view, in what way the deleterious matter enters the system, still, when we witness the numerous changes which take place in the atmosphere during the prevalence of the malady; that the epidemic commences in one place on the setting in of particular winds, and subsides in another after heavy showers of rain, or the re-

* Vide *Lancet*, "History of the Epidemic Cholera."

verse of this; it is not illogical to infer, that the poison is contained in the air we breathe.

What the source is whence this destructive agent is derived, it is unnecessary to attempt to show in this place—particularly as I can refer those, interested in the inquiry, to a work of mine expressly devoted to the subject.* It is sufficient, for the present object, to conclude, that the Epidemic, Malignant, or Blue Cholera, is produced by a specific cause; and that cause, the introduction into the system of an extraneous, deleterious, and poisonous substance.

Taking it for granted, then, that to this single cause we must ascribe the production of the disease under consideration; it only remains to ascertain how the poison acts, when thus introduced into the human body. This has been most ably accomplished by Mr. Bell, who has clearly shown, that the Epidemic Cholera is the effect of a derangement, or suspension, of those functions over which the sympathetic or ganglionic system of nerves presides.† As the circulation and distribution of the blood, and all the different secretions of the human body, are directly under the control of these nerves; and as branches from this system are distributed, not only to the heart, the arteries, the veins, and capillaries, but also to the organs of digestion and assimilation; we should expect to find

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* On the Remote Cause of Epidemic Diseases.

† On the Cholera Asphyxia.

that if, from any cause, the vitality of these nerves were diminished or destroyed, the action of the stomach and bowels would be deranged; the secretions perverted or suspended; the heat of the body diminished; and the circulation of the blood either partially or entirely arrested. Such we find to be the case in Cholera; for, as Mr. Bell justly remarks, from the very onset of the malady, all the secretions are arrested. In fact, the liquid thrown up from the stomach, or passed by stool, contains neither pancreatic juice, nor bile, nor mucous, nor excrementitious matter. The kidneys cease to secrete urine; saliva no longer moistens the mouth; the eyes are deprived of tears; carbonic acid is not given off from the lungs; and animal heat is no longer generated. This, therefore, is a disease which consists in the suspension of the organic functions—those functions over which the ganglionic system of nerves presides.

The apparent anomaly of copious dejections, at a time when all the secretions are suspended, has been satisfactorily explained by an analysis of the fluid evacuated, which has been proved to consist of the serum of the blood; while an examination of the body, after death, has discovered the venous system full of thick, viscid, and black blood, entirely deprived of its serous part. The phenomenon itself has been thus explained by Mr. Bell, in the work referred to. The venaporta not being provided with valves, this part of the venous system becomes easily distended, while the retrograde mo-

tion of the fluid distends the capillaries, which, from the loss of their contractile power, allow the serous part of the blood to escape—thus giving rise to the evacuation, from the bowels, of a fluid which so much resembles rice-water, and which forms so characteristic a feature of the disease.

Not only may we conclude, therefore, that this disease is the immediate effect of a suspension of those functions over which the ganglionic system of nerves presides; but, also, that this effect is produced from the injurious operation of an extraneous substance in the body—as we should be at a loss to explain the sudden and complete annihilation of the vitality of these nerves on any other hypothesis. More than this, we may also infer, that the poisonous element is contained in the circulating fluid, not only from the conclusion, before drawn, that the poison enters the system with the inspired air; but, also, because we should be unable to account for the production of all the phenomena witnessed in this disease, except on this supposition.

We not only conclude that the disease is produced by a lesion of the grand sympathetic, in consequence of the derangement observed in the functions presided over by this system of nerves; but, also, from the integrity of those functions under the direct control of the cerebro-spinal system. Except slight giddiness, which sometimes occurs at the commencement of the attack, and which can be explained by the sympathy which exists between

the stomach and the brain, the latter organ remains unaffected during every stage of the disease; and the intellectual faculties continue to perform their functions with the most perfect freedom, until the last moment of existence. The voluntary, or locomotive functions, also enjoy the same freedom, so that patients have been known to walk a considerable distance after the partial suspension of the organic functions; while it is a common occurrence for such persons to get in and out of bed, without assistance, up to the last moment of their existence, and when the circulation has been completely arrested for hours. We thus have the singular anomaly presented to us, of a complete suspension of the functions over which the ganglionic system of nerves presides; while those under the control of the cerebro-spinal system remain free and intact. This immunity, however, is only observed during the first three stages of the disease; for, in other cases, and in certain latitudes, in which the consecutive fever supervenes, the functions of the brain are disturbed, the same as in other forms of fever. The cause of this variation I shall not now attempt to enter into, but content myself with refering those interested in the subject to the physiological part of a former edition of this work, in which this phenomenon has been considered.

TREATMENT.

Having endeavoured to prove, that the disease known by the name of the Epidemic Cholera, Cholera Asphyxia, or Blue Cholera, is caused by the introduction of a poisonous substance into the system; the plan of treatment which, in this case, ought to be pursued, would appear to be that which is adopted with persons who have taken, either by accident or design, any particular or known poison. As, also, the poison of Cholera acts principally on the stomach and intestines—at least in the first stages of the disease—we may pursue the same course as when any substance, injurious to the health or safety of man, has been introduced into these organs by human agency. In these latter instances, the plan of treatment usually adopted has had two objects in view—the rendering inert, or removing out of the system the poisonous substance; and the alleviation of those effects which may have resulted from its presence in the stomach or other organs.

This would seem to be the course which, both from reason and analogy, we ought to pursue with persons labouring under the effects of the Choleroid poison—as far as our means of induction and proof enable us to proceed. As, however, the poison productive of Cholera is of so subtle a nature, that

we have been, as yet, unable to discover or collect it, either in or out of the body, we are necessarily prevented from making any of those direct experiments so conclusive in other cases. We have failed to ascertain, by analysis, what the nature or composition of this poison is; and, consequently, what are the substances capable of combining with it; altering its properties; or destroying its virulence. But, although debarred from pursuing this direct and conclusive course, there are yet other satisfactory, though less certain, proofs to be obtained by experiments conducted within the body. We must, under these circumstances, endeavour to ascertain whether any substance which is administered, either with this view or any other; and which, by its nature or composition, may be placed among the class of remedies termed antidotes, removes all the effects previously witnessed, with a celerity and certainty, that oblige us to refer the beneficial change to the operation of the medicine, and not to the efforts of nature, or any accidental circumstance. If so, and if, also, the same result is obtained in a sufficient number of instances, we may reasonably infer, that the remedy is an antidote to the poison. This conclusion, however, can only be drawn when neither vomiting, nor purging, nor other sensible or general effect, is produced, after the exhibition of the remedy; for, otherwise, as Orfila has justly remarked with respect to emetics given to persons who have swallowed any poisonous substance, we are not certain but that the restoration of the

patient may depend on the expulsion of the poison, —upon which the chemical re-agent has not exerted any influence. These remarks apply to a host of remedies, and particularly to what are termed the powders of Vivorera, extensively employed in some parts of Spain, as a remedy and specific in the Epidemic Cholera. These powders were originally prepared from an old receipt which fell into the hands of D. José Melgarejo, Pharmaceutist of Murcia; since which they have been employed, as a specific, in that part of Spain, in cases of poisoning from venomous reptiles and insects, and also in hydrophobia.* Of their virtue in these affections no doubt can exist; but that their efficacy is due to some general, and not to a chemical, or specific, action in the system, seems also equally certain— for they appear to have produced the like good results in cases of mineral and vegetable poisoning. As their action in the economy is that of a stimulating diaphoretic, to this effect must be ascribed all the cures that have been obtained by their administration; for we cannot suppose that the same combination would neutralize the poison of reptiles, or other animals; and, at the same time, destroy the irritant and corrosive properties of cantharides, arsenic, and corrosive sublimate. The same remarks will apply to the Epidemic Cholera; for although these powders were proposed as a

* They are composed of equal parts of "Eryngium campestre; Echium vulgare; Alyssum spinosum; and a species of Nepeta, or Catmint."

specific in this disease, I have only to add that, in one hospital, in which they were almost entirely trusted to in the commencement of the epidemic, they were subsequently abandoned as useless, and their place supplied by Carbonic acid. This is a fate that must attend all remedies, which act only on general principles—when trusted to, singly and uncombined, in every stage of a disease which presents various, if not opposite effects, at each separate period.

Independently of the remedy which will hereafter come under consideration, I am not aware that any substance has been hitherto given, which could be said to exert an antidotal power on the choleroid poison—if we except the various combinations of alkalies. These substances have been administered, by different individuals, with the view of neutralizing any acid matter present in the stomach; under the supposition that acidity in the primæ viæ was the cause of all the morbid phenomena. But the result of the practice does not warrant this conclusion, while other facts also tend to negative such an hypothesis.

If unable to effect this object—the neutralization of the poison—our only resource, then, is to endeavour to remove it out of the system, by those means usually resorted to on other occasions; or, such as experience points out as most eligible in this particular disease. Many different remedies, from their known action in the economy, and which have been employed by various practitioners,

tend to produce such a result; and have, doubtless, effected it, when either of these methods has proved beneficial. The success which has attended the exhibition of calomel, a host of emetics, certain purgatives, and diaphoretics, can only be explained on this principle.

In deciding to which of these two plans of treatment we ought to give the preference, did not experience but too fatally teach us the general inefficacy of the latter; common sense would inform us that the former must be the most certain, the most safe, and the only scientific course—provided the antidote is a simple and innocuous one. It will be my endeavour to prove, in these pages, that carbon, in its simple and compound forms, is that antidote; if so, nothing can be less hurtful or less injurious to the living frame. It is not only the most simple and innocuous agent that can be employed; but one with which Nature has herself provided the animal economy, for effecting certain salutary purposes. As Carbonic acid is secreted into the intestines, and always exists in the veins of a person in health, escaping afterwards by the lungs; its presence in these situations is, doubtless, for some wise and salutary object. Knowing that Carbonic acid combines with, and renders innocuous, putrefactive and other substances injurious to animal life; it is neither unreasonable nor unscientific to conclude, that this gas neutralizes the effects of those noxious and excrementitious matters which

always exist, to a greater or less extent, in such situations.

Having formed a particular theory respecting the Epidemic Cholera, I was induced (notwithstanding that the results of chemical investigation into the state of the blood in this disease were apparently against me), to administer the different forms of carbon, for the purpose of confirming or refuting the truth of my doctrine. The result of the first trials with this remedy, not only confirmed the expectations I had formed, respecting its efficacy; but led me to conclude, even at this period, that Carbon and Carbonic acid, *but more particularly the latter*, remedied the effects witnessed in the Epidemic Cholera; at the same time that they removed, by their specific action, the cause also. This will, it is hoped, be apparent to others, by a recital of the results obtained from the exhibition of these remedies.*

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* As it happens, there are few diseases in which it would be so easy to establish the truth of such a conclusion, as the Epidemic Cholera. The suddenness of the attack; the rapidity with which it proceeds; the intensity of the symptoms; and its fatal termination when unchecked by the efforts of art; render the beneficial operation of any remedy so apparent, that it is impossible for any one to be mistaken on the subject—unless we allow, with some persons, that recoveries from attacks of Cholera are sometimes due to the remedial powers of nature, as well as the efforts of art. Such a conclusion, however, is alike contrary to reason and experience, for, as the writer of the Madras Report truly remarks, we may consider *death* as the ordinary termination of Cholera; and there is, in truth, very little variety in the course which the disease pursues towards it.

In detailing the curative virtues of this agent, it is right to refer, in the first place, to the most common form of the remedy, viz., the simple Carbon or Charcoal. Although my own experience with this preparation has been very limited, in comparison to the other, or gaseous form, I can, fortunately, refer to the evidence of several other practitioners—and particularly to Dr. Wilson, of Xeres—in proof of its efficacy. This gentleman, who saw a notice in one of the English medical journals,* respecting the beneficial effect of the administration of Carbon, was induced, in consequence, to resort to this remedy in the severe and fatal irruption of the Epidemic Cholera in that part of Spain. Having resided at Xeres for some years, and enjoying a considerable reputation among the Spanish population, as well as among the English residents, Dr. Wilson not only attended a greater number of patients himself than any other practitioner; but, he was most ably assisted by several English merchants settled there, who nobly volunteered their services on the occasion. The latter confined themselves, almost exclusively, to the administration of charcoal, for it was only a simple and innocuous remedy like this, that could be safely employed by non-professional persons. Not so Dr. Wilson, as he was obliged, for the reasons that subsequently induced me to resort to other forms of the same remedy, to abandon the *exclusive* employment of Carbon in some cases; and,

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* Med. Chir. Review, Jan., 1833.

even its partial administration in others. These were the difficulty of inducing many persons to take it, in sufficiently large doses, by the mouth, on account of its homely and apparently disagreeable nature: the impossibility of superintending its exhibition by injection, in the majority of cases; and the great difficulty of obtaining a sufficient quantity of *recently* prepared charcoal, — circumstances upon which the success of its administration in a great measure depends.

Still, the cases treated by Dr. Wilson with Carbon *alone*, were sufficiently numerous to enable him to form a correct opinion of its efficacy in every stage of the disease; while, as regards his assistants, I was afterwards informed by one of them, that he considered several thousands were cured by the administration of Charcoal, as they had taken no other remedy. Dr. Wilson states, in the MS. which he forwarded to me, detailing the history of the disease in Xeres, that the Carbon was given from the commencement to the termination of the Epidemic, with such general good effect, as to have impressed him with the firm conviction, that "in all stages of the disease, it is a most beneficial adjuvant; and *anterior to collapse*, and in the stage of re-action most eminently curative;"—or, in other words, that it is a certain remedy for the Epidemic Cholera, when administered previous to the state of collapse. As a prophylactic, also, it gained a speedy reputation; and Dr. Wilson adds, that no one who took a dose of Charcoal morning and

evening, was confined with Cholera, though many, who so treated themselves, have felt its effects: that is to say, they have been attacked with the premonitory symptoms of the disease, or slight diarrhœa, which have yielded to an extra dose or two of Charcoal.

These results agree with those previously witnessed by me, on a more limited scale; for, while this gentleman confined himself exclusively to this form of the remedy, I, on the other hand, was induced, after the first trials, to abandon it altogether, except as an adjuvant in certain stages of the disease, and to depend, as exclusively, on the gaseous form of the same preparation,—a fact that Dr. Wilson was in ignorance of until my arrival at Cadiz, after the subsidence of the Epidemic in Xeres. Had he been acquainted with the superiority of the Carbonic acid gas, over the other form of the remedy; it would, doubtless, have prevented his resorting to other adjuvants, in the treatment of the disease; and thus negativing, to a certain extent, his otherwise important evidence.

As it is, however, we may fairly conclude from the facts already stated, not only that Carbon is highly beneficial, in attacks of the Epidemic Cholera, but, that it also possesses specific properties; for we know that this agent combines with, and renders innocuous putrefactive and other matters injurious to animal life, when added to them, either in or out of the body. This conclusion is strengthened by the result obtained from the administration of Car-

bonic acid gas—a form of the remedy to which the same objections do not apply as to the simple Carbon; while the effects witnessed are not only more apparent, but, also, more prompt and decided. This will be evident by a reference to the results that have been *invariably* observed by me, after the exhibition of Carbonic acid gas.

When this remedy has been given, in those cases in which symptoms denoting derangement of the stomach are alone present; the effect of the medicine, according to my experience, has been to relieve the symptoms almost immediately. The nausea is speedily dissipated; the giddiness and faintness disappear; and the sensation of burning and heat at the pit of the stomach, is no longer felt or complained of, after two or three doses of the medicine.

But, the most remarkable circumstance is that which has attended the employment of the same agent during the stage of diarrhœa—that relaxation of the bowels which is, almost always, the precursor of the severe form of Cholera. Of the numerous cases in which I have given the Carbonic acid, at this period, it has invariably arrested, with some few exceptions to be explained hereafter, the morbid process; at a longer period, it is true, but still at a regular and certain interval.

Neither is the remedy less useful in what has been termed the evacuant, or second stage of the disease, characterised by rice water evacuations. In these cases, the irritability of the stomach is

speedily relieved, and the vomiting ceases soon after the first, or, at most, the second dose of the medicine; while the relaxation of the bowels is also arrested with as great, if not greater, celerity than in the former instance.

But it is in the commencement of collapse that the efficacy of the remedy is best observed, and its *modus operandi* the most apparent. Not only is the vomiting immediately arrested, as in the previous stage, but the thirst, heat, and burning sensation at the pit of the stomach, disappear almost as speedily. During a repetition of the medicine, the spasms, which generally prevail at this period, are effectually relieved; the evacuations from the bowels become less abundant and less frequent; the depression of the system is removed; and the other symptoms, characteristic of this stage, vanish by degrees—so as frequently to leave the patient comparatively free from all ailment, after the administration of only five or six doses of the medicine. These remarkable, and hitherto unexampled circumstances have frequently excited the attention and admiration of others, and are dwelt on with peculiar emphasis, by Drs. Ardèvol and Pascual, in the reports which are added in the Appendix.

It now only remains to ascertain the influence which the remedy exerts in the state of confirmed collapse. When it has not been previously administered, its employment at this period is not constantly followed by any sensible effect, or beneficial result. This, however, is only what might, and

what ought to have been expected, from the employment of such a remedy at such a period—there being several causes in operation, either of which alone would, it is probable, satisfactorily account for the failure observed in this instance.

In the first and second stages of this disease, and, generally speaking, in the commencement of collapse also, we should *à priori* have been led to infer, that no obstacle exists to the complete neutralization of the poison—an inference confirmed by an extended experience in the administration of the remedy now under consideration. But, in the state of confirmed collapse, when the circulation is entirely suspended, the same result can hardly be expected to follow—at least by the introduction of the remedy into the stomach. It is then more than doubtful if absorption can take place, excepting to a very limited extent; as the experiments of Magendie on animals have clearly and satisfactorily demonstrated.*

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* In stating my belief that Carbonic acid is an antidote to the poison of Cholera, and that, when introduced into the system, it is capable of neutralizing the morbific matter productive of the disease, I presume that no objection will, or can, be offered to such an inference. All doubts on this point would appear to be solved by the result of the experiments of Drs. Lawrence and Coates, as detailed by Dr. Copland in his Notes to Richerand's Physiology. In reasoning upon the subject of absorption, the question has frequently arisen, (observes this writer) whether the articles found in the living fluids exist there as chemical substances; or, have their chemical nature altered and animalized by the action of the vessels through which they have entered the system. It was, therefore, deemed a curious subject of inquiry, whether artificial chemical changes can take place in the fluids, while they continue to cir-

But, although we were certain of accomplishing this most desirable object—the neutralization of the poison—it is doubtful whether we should, without the assistance of other adjuvants, be also able to remove the state of collapse—when it has become confirmed, or has been of long continuance. It is clear that, at this particular period, two things are necessary; first, to remove the cause, and then to remedy the effects of that cause—both which are probably to be effected by opposite and different means. It is not likely that the agent, which neutralizes the poison, (the injurious operation of which on the system is the cause of the collapse,) will also be able to remove the collapse itself, unless it were a compound substance, possessing, besides its specific properties, those of a stimulating nature, or such as act directly on the nervous system. In cases of partial collapse, the mere removal or neutralization of the poison has been, of itself, sufficient to restore the patient—as the history of numerous cases tends to prove. But, in the majority of instances of confirmed and long-continued collapse, can the same effects be expected to follow similar,

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eulate in living vessels, and the ordinary actions of life go on. With a view of ascertaining this point, they commenced by throwing prussiate of potash into the cellular substance, and green sulphate of iron into the abdomen; in order to try whether the well-known result of their admixture, prussian blue, would be produced in the vessels. On performing this, they were gratified by the striking result of a distinct and beautiful blue in the thoracic trunk and its contents; and, in nearly the whole substance and surface of the lungs.

or other more specific plans of treatment? Experience obliges us to declare, that such a result has been but seldom witnessed as yet; and, that it will be but seldom observed in future—if the disease is allowed to run on unchecked to the state of confirmed collapse. When this state has existed for a certain length of time; when the blood has ceased to circulate in the body, perhaps, for hours; when every vital function has become suspended, and the energy or vitality of the nerves all but annihilated, —the organic life of the individual may then be said to have become extinct; and that portion of the system as lifeless as the body which has ceased to breathe. If such is the state of a patient in the collapsed stage of Cholera, can it be expected that the mere removal or neutralization of the poison, were we able to accomplish this, will be sufficient also to remedy the effects produced by the presence of the deleterious agent when introduced into the human body? Reason and analogy both lead us to answer in the negative. When a man, after receiving a severe blow on the head, has a portion of his skull fractured and depressed; the pressure on the brain will be sufficient to deprive him of consciousness and voluntary motion. If, however, the skull be trephined, and the depressed portion elevated, soon after the accident; the mere elevation of the bone will be adequate to the restoration of the patient. But, if this pressure has been continued beyond a certain time, the energy of the brain will have become so far destroyed, that the appli-

cation of the trephine, and the use of the elevator, will be insufficient to restore him to consciousness or voluntary power; and he sinks, the victim of delay. So, again, when any of the various and numerous classes of poisons have been taken, either by accident or design, if they are immediately neutralized, or evacuated from the stomach, the effects resulting from their exhibition also disappear, with the neutralization or removal of the morbid matter. But, if a particular interval has elapsed, before these desirable objects are attained; we shall then have to remedy the effects which have resulted from the longer presence of the poison in the system—effects but too frequently followed by the extinction of life.

That, in the collapse of cholera, the nervous energy is in a state of great depression, there can be little doubt; as the suspension of those functions over which the grand sympathetic presides must be entirely ascribed to the depressing influence of some morbid cause on this portion of the nervous system. In fact, it is certain that, when this state has existed for a certain period, the vitality of these nerves becomes almost, if not entirely, destroyed. Although, therefore, it be allowed that Carbonic acid gas is an antidote to the poison productive of the Epidemic Cholera, it is evident that, in the state of confirmed collapse, another and a different agent is required to excite the nervous system; as the above remedy, if it exert any direct

action in the economy, acts rather as a sedative than a stimulant.

In conclusion, I will only add that we shall never arrive at a fair and impartial decision, respecting the antidotal power of any remedy in this disease, if we limit our view of its operation to that period when the collapse of the system is complete. We cannot then judge, except indirectly, and by comparison with other cases, in which the antidote has *not* been administered, whether the poison has become neutralized or not; as the mere neutralization of the poison alone, may not be sufficient to save the life of the individual. In using other means and other remedies, as we necessarily must, to combat symptoms—the effects of the poison on the system—we run the risk of mistaking the action of these remedies; and confounding those, which tend to remove the cause, with those which are only able to remedy the effects. We are consequently necessitated to restrict our view, in seeking for an antidote, to the first periods of the known operation of the poison on the system; or, in other words, the first two stages of the disease, and the commencement of collapse.

If this conclusion be correct, we can hardly fail to infer, after what has been said respecting the effects of Carbonic acid gas in the first stages of the disease, that this chemical agent is an antidote to the poison productive of the Epidemic Cholera. At least, it appears to me to be impossible to ex-

plain its *modus operandi* on any other supposition, while a slight consideration of the subject, will, I trust, convince every unprejudiced person of the truth of the inference.

Putting aside the cessation of the vomiting, which may be referred to a local action of the remedy, to what, I would ask, are we to ascribe the relief of the other symptoms, particularly the cessation of the purging? Not to any astringent property of the remedy, as I have often ordered this medicine with success, in cases of constipation; thus showing that, if it exert any action on the large intestines, it is as a relaxant, rather than as an astringent. As, also, the common saline effervescing draught has usually been administered, tartrate of potash or soda, a purgative medicine, has been taken at the same time. The quantity thus taken would not, it is true, have been sufficient, in every case, to produce a purgative effect with persons in health; yet as, at the epidemic periods alluded to, even an excess of ripe fruit, or vegetables, is so generally followed by relaxation, it may be asked how it happens that the contrary result is obtained in this instance.

Again—to what are we to ascribe the relief of the spasm? Not to the anti-spasmodic property of the medicine, for this remedy has no action in common with the greater number of those belonging to the class of antispasmodics.

And, lastly; to what is the removal of the depression of the nervous system and the state of

collapse owing?—to the stimulant property of the remedy? Assuredly not; because it possesses, if any action, that of a sedative—as is well known when this gas is inspired in any quantity. Neither can we ascribe the removal of the latter symptoms to the relief afforded to any of the others; for these various phenomena can only be common effects of one common cause, being sometimes present, sometimes absent. Besides, I have experienced the same result when vomiting, or purging, or spasm, or collapse, was alone present, and the remaining symptoms altogether absent. Had the Charcoal been alone given, it would have been impossible to draw the same conclusions in a disease like that of the Epidemic Cholera; for it possesses, besides its antiseptic, astringent, and stimulating properties. To these last mentioned properties, therefore, the arrest of the diarrhœa in one stage, and the removal of the state of depression in another, might have been ascribed—had we no other evidence that the benefit observed, after the administration of Carbon, was due to a specific, and not to any other, or more general, action of the remedy.

How, then, we may ask, can a remedy act which arrests the most severe and long-continued vomiting at the first or second dose, and this, too, after every other calmant and narcotic has failed;—which, possessing no astringent property, puts a stop to the most profuse purging;—which, endued with no known anti-spasmodic virtues, instantly

relieves the severest spasms;—and which, although acting as a slight sedative, produces reaction, and removes the depression of the nervous system at a time when some of the most important of the vital functions are almost entirely suspended? A remedy which produces so many and such various results, and which has no sensible or direct action in the economy, can only act in one way—that is, by removing the cause of these various phenomena; and, as that cause has been shown to be the presence of a poison in the system, the agent which removes it, or the effects produced by its injurious operation, must combine with, and render innocuous the deleterious matter, and will therefore become an ANTIDOTE to the poison, and a SPECIFIC for the disease.

DIRECTIONS FOR THE ADMINISTRATION OF THE REMEDY.

At the first onset of the attack, when those symptoms are present which denote derangement in the stomach, unaccompanied or preceded by diarrhœa; any of the preparations which contain Carbonic acid, may be given and repeated every hour, until all unpleasant symptoms are entirely dissipated. The first dose has always, with me, given immediate relief; and the third, at most, removed every symptom, but that of a peculiar sensation of lassitude and languor.*

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* As it is absolutely necessary that the medicine should be taken in a proper manner (for, otherwise, the patient will only be swallowing a simple solution of tartrate or citrate of soda, instead of a certain portion of Carbonic acid gas); it may not be superfluous to point out what I consider the best mode of preparing the remedy.

Thirty grains of the powdered carbonate, bicarbonate, or, as it is now termed, sesquicarbonate of soda, or potash, should be put into a large tumbler, with a wine glassful of water; to which is to be added a dessert spoonful of any simple syrup, mixing the two ingredients together so as to form a homogeneous mass. Then take twenty grains of citric, or tartaric acid, and dissolve it in half a wine glassful of water, when the solution is to be poured on the contents of the tumbler, and the mixture drank off immediately, before the effervescence has subsided. If more convenient, or when to be obtained, lemon-juice may be substituted for the citric or tartaric acid—in the proportion of two table spoonsful of lemon-juice to the same quantity of soda or potash. As the object in giving the syrup, is to render the mixture more tenacious, and to prevent the gas escaping so rapidly as would otherwise be the case; it is not necessary, when the lemon-juice is used, to add any syrup.

In the preliminary diarrhœa, three or four doses of Carbonic acid gas, which should be taken every two hours, is, in general, sufficient either to arrest the diarrhœa, or, to change the character and appearance of the evacuations. Should the relaxation continue, however, after the medicine has been taken three or four times more—which is sometimes the case in particular individuals, suffering from debility, or exposed to external causes, as cold, or damp weather—it will then be advisable to substitute the simple carbon, which ought to be continued until the purging has entirely ceased. The best and most efficacious way of administering the Carbon at this stage of the disease, is by Enema—two or three table spoonsful of the powder being mixed with any convenient fluid, and suspended in it by means of the white of an egg; or, if preferred, a table spoonful of the same preparation may be given by the mouth, and repeated every two hours, until the purging ceases. When, however, the Charcoal cannot be obtained, or the patient objects to take it, which frequently happens, we may then substitute the prepared chalk, or the common Mistura Cretæ. These preparations never fail to remove the relaxation *after* the administration of Carbonic acid gas, to the extent already advised. This difference in the effects of the remedy, at these two periods, may, perhaps, be ascribed to the circumstance that, in the latter instances, the Carbonic acid does not reach the large intestines in suffi-

cient quantity to arrest the morbid process—the principal part of the gas being absorbed from the stomach and conveyed onwards to the lungs, where it will escape with the expired air. The greater benefit derived from the chalk may, therefore, depend on the Carbonate not being decomposed entirely in the stomach; or, the whole of the gas liberated, until the remedy reaches the large intestines. The astringency of the lime will also tend, at this period, to effect the object which we have in view; for although I have but too often witnessed the inefficacy of pure and simple astringents, when given alone, they may be advantageously employed when only intended to remove the simple relaxation consequent upon the previously depressing operation of the poison; that is to say, remedy an effect, the cause which produced it having been before removed by other and different means. The superior efficacy of the common Carbon may also be explained on similar grounds—the non-decomposition of this substance in the stomach, and its arrival in the large intestines in the same, or nearly the same, state as when first introduced into the above organ.*

But it is not alone sufficient to remove the symptoms, which may have existed in the above

* In making use of this remedial agent, it is of the utmost importance that it should be recently prepared—otherwise, little or no benefit will attend its exhibition. In fact, it ought to be prepared at the moment, or, at least for the occasion, and be preserved from the contact of the external air, in glass-stoppered bottles.

divisions of the first stage of the disease; it will also be necessary to continue the administration of the gas, at longer intervals, until we suppose that all danger of the supervention of the other stages has entirely passed. When this period may be, will, of course, vary with different individuals; but it cannot be difficult for a professional man, conversant with the *reigning type* of the epidemic; and acquainted with the usual march of the disease in other cases, to form a fair criterion of the probable time when the collapse would have supervened, had the disease run on unchecked to that stage. As, also, no harm can result from the employment of the remedy for weeks, much less days (administered every three or four hours); it will always be allowable to err on the right side, and to give the patient the benefit of any doubt that may arise on this point, by continuing the medicine for a longer period than may be considered absolutely necessary for his safety or recovery.

In the second stage of the disease, characterised by rice-water evacuations, as the malady has then arrived at a point from which it always proceeds, at an accelerated pace, to the next period; it will be requisite to administer the remedy at shorter intervals, as every half hour, until not only the vomiting, but the purging also, is entirely arrested.* If

* Instead of the saline effervescing draught before recommended, soda or seltzer water may also be administered, One objection, however, which applies to these, and all other kinds of bottled aerated liquors,

the first dose, as sometimes happens, be rejected, it should be immediately repeated without waiting for the regular interval. So, again, after four or five doses of the Carbonic acid have been taken, if the purging continues to any extent, it will be advisable to administer the simple Carbon, either by the mouth or by injection—giving a table spoonful every hour in the former case, and three or four table spoonsful in the latter. This the patient must endeavour to retain as long as possible; but, if passed immediately, it should then be repeated, as well as after each evacuation; or, at least, as long as the fluid preserves its peculiar characteristic, and contains neither bile nor excrementitious matter.

Collapse.—In the *commencement* of the stage of collapse, if no Carbonic acid has been previously administered, a draught should be given every quarter of an hour, until three or four doses have been taken. The medicine should then be continued every half hour until the purging has ceased, or the character of the evacuations has changed, and they have become excrementitious; and until, also, the symptoms of collapse have yielded to the means employed, and the re-action is fully esta-

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is, that, during moments of anxiety and sickness, unless the patient and the attendant are well accustomed to the administration of such drinks; it is seldom that the draught is taken before a considerable part, or nearly the whole, of the confined air has escaped from the containing fluid. In this case the remainder would be, in a great measure, useless; as, unless under pressure, water absorbs and retains but a small quantity of Carbonic acid gas.

blished. When the purging is severe, or of long continuanee, it will be neeessary to administer the simple Carbon, either in the form of injeetion, or, by the mouth, the same as in the previous stage, and in the manner there pointed out.

As far as my own experienee and observation go, the above treatment, if adopted at the *commencement* of the stage of eollapse, is all that is required; for I have never met with more than three eases of failure out of many thousands, to whom I have either given the remedy myself, or known it administered by others. One of these patients was affeeted with caneer, and in a state of great debility; the seeond laboured under an affection of the heart; and in the third, the attaek was brought on by the improper administration of a strong purgative—the effeet of whieh eontinued until the patient suddenly fell into a state of collapse. All the means employed were insuffieient to remove the eollapse, or to arrest the purging.

Occasionally, however, I have met with patients in whom—notwithstanding that the vomiting and purging have been arrested by the above treatment, and the state of eollapse partially relieved—the reaction has yet been so slow, that it seemed desirable to assist the efforts of nature by the administration of some stimulant. The best that can be used at this period is, in my opinion, the earbonate of ammonia, which may either be given alone, or be added to the soda of an effervesein draught; aeeording to the number of doses that have been

taken of the soda, and the necessity there may appear to be for the repetition of the gas. On this point no general rules can be given, for much will depend on the state of the patient; the effect that has been produced; and, lastly, the previous state of the bowels—as, when the evacuations are profuse and frequent, we have a right to presume that a great part of the remedy escapes out of the body, by this channel, without being absorbed.

But we must be prepared for cases of sudden and complete collapse, which have not been preceded by the other stages of the disease; and in which the situation of the patient is so dangerous, and the period allotted for the efforts of art so short, that nothing but the most active and vigorous treatment will be sufficient to raise the sinking powers, or to keep alive the flickering flame. Our only resource, under these circumstances, will be—in addition to the means already pointed out for the treatment of a patient in the commencement of collapse—to resort immediately, if the symptoms are very urgent, or else, after the first few doses of the gas, to direct stimulants—as the different preparations of æther, the essential oils, carminatives, and diffusible stimuli. The selection of these must be left to the judgment of the attendant practitioner, as they will necessarily vary under different circumstances; for a remedy that would act with great energy with particular persons, and in particular countries, might be, to a certain extent, inert and useless in others. These

attacks of sudden collapse, if incomplete, although requiring the most prompt aid and energetic measures, yield more readily to remedial means—when they are properly directed—than those cases in which the collapse comes on more slowly; and in which it has been preceded by the previous stages. When, however, re-action takes place, or has been established, and symptoms supervene, or remain, characteristic of the other stages of the disease (for in these instances the collapse is sometimes accompanied, and sometimes followed by vomiting and purging, the treatment of the case will then be the same as if the collapse had been preceded by the other stages, and the disease had followed its usual course.

Fortunately, these cases of sudden collapse are comparatively rare, except in India; for in colder climates, or in Europe, the state of complete collapse only supervenes after being preceded, for several days, by the preliminary diarrhœa; and after being ushered in by the symptoms characteristic of the second stage of the disease. There is, therefore, under ordinary circumstances, abundance of time to arrest the progress of the disease before the patient arrives at the state which has been aptly compared to that of a living corpse; and when, for the reasons before given, so many obstacles exist to the successful administration of any remedy. Unhappily, the treatment hitherto pursued has been insufficient, in the majority of cases, to prevent the supervention

of collapse, even when resorted to in the first stages; while, as regards the remedy under consideration, more evidence will, I fear, be required, than that now produced, before the generality of practitioners can be induced to resort to it at the commencement of the disease, or until their own means have failed—even supposing the deductions drawn by me to be correct. As, therefore—either from a failure in the ordinary means employed, or from accidental circumstances—cases of confirmed collapse will occur in practice; it is a duty incumbent on us, to be prepared for the supervention of this state, and to ascertain what measures we can depend on for its removal.

Although endeavouring, in the previous chapter, to impress on the minds of my readers the important inference, that if we wish to judge of the effect of the remedy, we must resort to it previous to the state of confirmed collapse; it does not follow that no good will result from its administration at this period. On the contrary, it must be plain that, although we cannot then judge of its antidotal properties, we must, having established this point by other evidence, place our chief dependence on Carbonic acid gas at this period of the disease, the same as in the previous ones. There is, however, this important difference—that, whereas the administration of the antidote is sufficient of itself, to remove the disease in the first stages, and under every variety of circumstances, we shall be obliged, in the stage of collapse, to com-

bine it with some stimulant, in order to remedy the effects produced by the long continued operation of the deleterious agent, the primary cause of the attack. But, notwithstanding that it is necessary to resort to stimulants, we must not conclude that this class of remedies is alone necessary at such a time; or, that their exhibition would be attended with general good results, unless preceded or accompanied by some antidote, or other agent, capable of expelling the morbid matter out of the system. As the stagnation of the circulation, and the suspension of those functions termed vital or organic, are produced by the presence of a poison in the animal economy; the state of asphyxia can only be an effect of a particular and antecedent cause. The death of the individual, also, is due, not to the effect, but to the cause; for the extinction of life is but an effect, or the sum total of all the effects, produced by the same cause. How, then, could we hope to save life, if our views were limited to the remedying an effect—the state of collapse—without having any regard to the removal of the cause—the presence of a specific poison? To attempt to arouse the nervous energy, at a time when another agent is in operation which tends to depress it, without taking any means to rid the system of its noxious presence, would be like pouring oil, as well as water, on the fire which we were endeavouring to extinguish. But, even although we should succeed in exciting the dormant energy of the nerves and restoring the

circulation, the patient would again fall into the same state, if the means resorted to were not such as to cause the neutralization, or the expulsion of the poison out of the system. As, however, this proposition is so self-evident, I shall not attempt to pursue the subject any further, but merely add; that the proper and only scientific plan to adopt, under these circumstances, would be, before resorting to stimulants, and afterwards, in combination with them or at the same time, to administer the antidote, the same as in the previous stages.

Independently of analogy and reason, I can confidently state, as the result of my own experience, that the exhibition of Carbonic acid gas is most beneficial in the state of confirmed collapse—a conclusion verified by other practitioners, as will be evident by a reference to the reports added in the Appendix. Although, therefore, we could not, if administered only at this period, assure ourselves that the remedy possesses antidotal or specific properties; we have, nevertheless, proof afforded us that its employment is beneficial, even in these, apparently hopeless, cases—independently of the fact that what is a remedy in other stages of the disease, must be advantageous, even in that of complete collapse. We are, therefore, bound to resort to Carbonic acid gas at this period, and to persevere in its use, until either reaction takes place, or all hope has entirely vanished. Should we fail, we shall have the satisfaction to know that our want of success is due, not to the wrong measures

adopted, but to the insuffieiency of the means for the end desired; and we shall learn that, in this disease, as in all others, there is a limit to human skill, and a power, which presides over life and death, greater than that possessed by weak and finite man.

If, therefore, from any cause, we should, unfortunately, be called to a patient, in a state of complete collapse, to whom either no remedies have been previously given, or with whom the treatment pursued has failed to relieve the morbid state; we ought to resort, in the first place, to the administration of the different forms of Carbon, in the manner and to the extent already pointed out. In addition to this, we must have recourse to some stimulant, as ammonia, which can be added to the effervescing draught, or be given alone according to circumstances. But should these means fail to produce the desired object, or re-action, after a short time, we must then make use of other and more direct stimulants—as those before recommended in cases of sudden collapse—administering them cautiously and in succession, so as not to excite the nervous energy too powerfully in the first instance, and thus to cause subsequently, and in cases of failure, as sudden a depression. It is, in fact, of the utmost importance, not to exhaust the remaining vitality of the body prematurely; as it is impossible to say what length of time a patient may remain in a state of complete collapse. Dr. Kellet relates a case, where the pulse was

gone within three hours from the attack, yet the man lived, in that state, from the 3rd of October, at 4 p.m., to the 6th of October, at 2 p.m.—70 hours.

It will be necessary, however, to watch the effect of stimulants, as long as the purging continues excessive and characteristic of the malady; for the effect of this class of remedies is frequently to increase the evacuations from the bowels when first taken. In this case, the administration of pure Carbon is often attended with considerable benefit, by arresting the purging, and thus enabling the patient to take stimulants more freely and with greater advantage.

In addition to the above, we may advantageously resort, at this stage of the disease, to another and a different adjuvant, that of a stimulating diaphoretic. I can recommend such a medicine with the more confidence from the good effects I have witnessed after the exhibition of what are termed the powders of Vivorera, before referred to. If I am not mistaken, the good effects resulting from the administration of this remedy, are chiefly limited to the stage of collapse—as we should *à priori* have supposed, from a consideration of the *modus operandi* of the medicine. It is then that a stimulant, by exciting the nervous energy, and a diaphoretic, by relaxing the minute capillaries, and favouring the escape of the pent up matter, may possibly produce a favourable result. This effect is more likely to be witnessed when we have, by the pre-

vious administration of an antidote, succeeded in neutralizing a portion of the matter productive of all the dangerous symptoms, without having been able to effect the neutralization of the whole; or, to remove the depression produced by the previous action of the poison on the nervous system. It has been under these latter circumstances that I have had reason to form a favourable opinion of this medicine; and I venture to recommend the same, or others whose action in the economy is similar, to the consideration of my professional brethren, believing that it may be advantageously resorted to for fulfilling the above indication.

These are the principal, if not the only measures which I consider it advisable to adopt for the removal of the disease. There are some others, however, which would seem to require a short consideration.

And first, as to frictions. If we consult only experience, and set aside all preconceived opinions and theories on the subject, we shall be forced to confess that this operation is, to say the least of it, useless; and not very unlike the attempt to wash the black man white. This, however, is not all; for it appears to me that the resorting to this process, in the early part of the stage of collapse, has often been productive of much injury, by exhausting the energy of the system and diminishing, instead of increasing, the subsequent temperature of the extremities and external surface. Considering that the generation of animal heat is all but impos-

sible, at that period when the functions of the lungs are entirely suspended; nothing should be done that can possibly tend to exhaust prematurely the small quantity of caloric that may yet be retained in the nearly inanimate body. Such a result must certainly be expected to follow the application of strong liniments and spirituous embrocations—perseveringly used by three or four assistants.

So, again, as regards the value of the application of external heat, by means of the vapour and hot air bath. With respect to the former, the trials that have been given to this agent in India, in Russia, and lastly in England, not having answered the expectations that had been formed respecting its utility, it seems now to have been abandoned by the generality of the profession. Not so, however, with the hot air bath, for this method of applying heat has not only met with more advocates, but seems to have been attended with more favourable results. Notwithstanding, in numerous cases, the application of heat is highly distressing, and seemingly injurious—even when the coldness of the external surface is the greatest. The bedclothes, also, are often oppressive; and it is with difficulty the patient is persuaded to retain even a sheet, so anxious is he to expose his body to the contact of the external air. On these several accounts, therefore, we must consider even the hot air bath as only an occasional and uncertain adjuvant, whose place we must endeavour to supply with other and more certain means.

As, in this disease, the burning sensation at the pit of the stomach is so great, and the thirst so urgent, that it is with difficulty the patient can be debarred from partaking freely of whatever fluid is within his reach; and as so much difference of opinion exists on the subject, some explanation will naturally be expected on this point. It must be familiar to all, that, in England, copious draughts of cold water were employed as a remedial agent in this disease. The success attending the practice was, doubtless, to be ascribed to the emetic effect of the water—a success common to many remedies possessing the same property. But, although numerous and highly interesting examples are recorded of recovery by these means, in apparently hopeless cases; subsequent experience, and a more extended trial, proved that, in others, the re-action which took place, after recovery from the collapsed stage of the disease, was greater and more dangerous than when this practice was not adopted. In India (if we credit the united testimony of all the practitioners there), when cold drinks were allowed, and when the patient, in spite of the instant rejection of the fluid, persisted in its use; the result which has been so frequently witnessed in England, —the recovery of the patient—was seldom observed there. On the contrary, as Dr. Young has remarked, if this craving for cool drinks was indulged in, the frightful state of collapse soon succeeded, and all the bad and dangerous symptoms were immediately increased. It is not surprising therefore, that, after witnessing such results, a total ab-

stinence from all liquids was strictly enjoined by the majority of the profession in that country; and only administered by others, in the smallest possible quantity, as a table spoonful at a time, until the worst symptoms had disappeared.

With such different results before us, and such a diversity of opinion, it might be somewhat difficult to give a safe guide or general rule on the subject. But being fully convinced that the great and urgent thirst, in this disease, can be relieved by more certain and less doubtful means; and believing that it is not requisite or desirable to resort to such a remedy on account of its emetic effect, the necessity for any rule is, in this case, entirely done away with. In administering Carbonic acid, in this disease, the burning heat in the region of the stomach, and the great and urgent thirst, are not only more effectually relieved than by any other means; but these sensations are *speedily and entirely removed* by this simple and single remedy. In giving or withholding any liquid, I have been guided entirely by the patient's own wishes and feelings; not having seen any harm result from the use of simple diluents, as toast-and-water, as soon as one or two doses of the medicine have been exhibited. On the contrary, in the evacuant period of the disease, and more particularly after the cessation of the intestinal discharges, it is advisable and necessary to encourage the patient to partake freely of liquids; in order to supply the place of the discharged serum, and to restore the lost fluidity of the blood.

And next as to Opium. As this remedy has been

so extensively employed in this disease, particularly in India, some notice of it would seem to be required here. Judging from the properties of the medicine, and its known effects in other diseases, as well as from the evidence of those best entitled to our confidence; the use of opium ought, even in those cases in which it is principally depended on, to be restricted to the first two stages of the disease, and the commencement of collapse—and then only to be employed to allay the irritability of the stomach and to remove the spasms. Now it is precisely at these very periods, and for the removal of these particular effects, that Carbonic acid gas is the most beneficial; and its action the most prompt and certain. If, therefore, this remedy be had recourse to for the treatment of the disease, the administration of opium will be unnecessary, if not detrimental, in those cases in which its employment is most indicated; while it is actually injurious in all others—particularly those of an insidious character, in which spasm and vomiting are absent; in which the purging is moderate, and symptoms of depression are present. As regards its employment in the stage of collapse, we can only offer individual opinions, as it is impossible to ascertain with certainty its effect at this period, particularly when combined with other remedies, as is generally the case. Reasoning, however, from analogy, it would seem that the administration of opium, in the state of complete collapse, must be alike useless and injurious; and

for this simple reason, that opium, when administered in large doses, produces effects similar to those witnessed in the Epidemic Cholera, viz. :—an arrest of the different secretions, and a suspension of all the vital functions. Can it therefore be judicious ; can it, I would ask, be scientific to employ, even in small doses, a remedy which appears to produce effects, similar to those witnessed in the disease for which it is given—effects which, if not removed, must end in a few hours in the death of the individual ? Reason and experience both answer in the negative, for, independently of the arguments just used, it appears probable, as has been suggested by other writers, that the poison of Cholera, is of a sedative nature ; while many practitioners, and some of those who have had the most experience in the administration of opium, positively state that it is detrimental in every case of confirmed collapse.*

Lastly, as regards that universal medicine, mercury. Knowing the influence which this remedy exerts on all the secretions, and the specific action which it produces on the capillary system,—were I obliged or induced, by any cause, to resort to the treatment by expulsion, mercury, in some one of its forms, would be my principal resource. But being satisfied that there is an agent capable of neutralizing the morbific matter of this disease ; and that these means, as well as all others that we possess for the expulsion of the poison are uncertain

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* Vide Bengal and Madras Reports.

in their operation; while it is clear the remedy itself undergoes no change when introduced into the stomach in the stage of collapse, the use of calomel is necessarily limited to one purpose—the exciting the flow of bile, and aiding in restoring the suspended secretions. But, as the arrest of the flow of bile, and the suspension of the other secretions, are but effects of one common cause—the action of a poison in the system—it must be more reasonable to wait until that cause is removed, before attempting to remedy the effects which have been produced by it. The writer of the Madras Report, in reference to this practice, remarks, "Calomel has unquestionably a powerful effect in exciting the biliary system, and, in this view, its exhibition is highly necessary; but the suppression of the excretion of bile being only a link in the common chain of symptoms; and its partial or occasional removal, or even its total absence, having been proved to be of little consequence in the general course of the disease, to attempt to excite it by particular means may be considered as premature and injudicious." In this view of the subject every reflecting person must concur; and believing that there is an agent capable of removing the cause of the suppression of the various secretions, my plan has been to wait until reaction has been established, and all the dangerous symptoms removed, before resorting to calomel, which I have then prescribed for the single purpose of aiding in restoring the suspended secretion of bile, when the treat-

ment previously adopted has not been sufficient to produce this result, but which, however, in the majority of instances, has been the case. As, also, it is an object to clear the system of those excrementitious matters, which, by the suspension of the secretions, have been retained in the system, some purgative medicine, as castor oil, should likewise be taken five or six hours after the administration of the calomel.

We sometimes, also, meet with cases in which a tonic is required after an attack of Cholera. But in the majority of instances, particularly when the treatment now recommended has been had recourse to, in the first stages of the disease, the recovery is so rapid, and so perfect, that such remedies would be alike useless and unnecessary—except in persons who were in a state of debility previous to the supervention of the attack of Cholera. Such cases will, of course, be treated in the usual way, and the same as after recovery from other diseases:—unless we have reason to believe that, from the maladministration of the medicine in the previous stages; or from some peculiar exposure of the patient to the original source of the poison and its continued operation on the frame (which is sometimes observed in particular localities), it would be advisable to continue the administration of the antidote until the debility, or symptoms of depression have been removed, and all fear of a relapse has passed away.

APPENDIX.

In addition to what has been already advanced respecting the efficacy of the different forms of carbon, it affords me the highest satisfaction to be enabled to give the following confirmatory and more valuable evidence from the pens of several of my brother practitioners.

In the narrative of the Cholera, published in the Lancet, we find this observation, in the chapter on the treatment:— "An exceedingly simple remedy was used; and, it is said, "with unprecedented success, on board the Ships belong- "ing to the United States. A common bottle cork was "burnt, and the powdered coal given in a little milk or "water. The third dose, at most, was sufficient to allay "the urgent symptoms; and we are assured that it has, "more than once, saved patients almost in the agony of "death."

Again, by a letter from M. Moreau de Jonnes, inserted in the same journal,* we learn that Dr. Gavardan of Arras, had administered a table-spoonful of wood charcoal, in an opiated enêma, during the prevalence of the Cholera in the Pas de Calais. In twelve cases, of which he gives the de tails, the cure was complete and immediate. In several others, he omitted the opium with the same success.†

In consulting the practice of different individuals, and

* Nov. 19th, 1832.

† Subsequently to this, we received accounts of the success which an eccentric and unknown individual had met with, in Canada, by the employment of the same remedy. It appeared, from the particulars then given, that

perusing the documents transmitted to the central Board of Health, it will be discovered that, after the first appearance of the disease in England, Carbonic acid gas came to be more and more generally adopted, to allay the irritation of the stomach and to check the vomiting, not only in the first stages of the disease, but in that of collapse also.

Thus, soda water, solution of soda, and effervescing draughts, were used, in the treatment of the disease, by the surgeons at Cawood, near Selby; and by the medical practitioners at East Retford.

Two cases of *confirmed* collapse, successfully treated by Mr. Radcliffe with Carbonic acid gas, were inserted in the Lancet;* while the same remedy, as I have since learnt, was extensively employed in Devonshire,—particularly at Plymouth,—and with such success as to attract the attention of unprofessional persons.

Dr. Stevens, so well known as the proposer and advocate of what was termed the saline treatment, has the following remarks appended, by way of note, to a paper respecting the above method :—"When the stomach is ir-"ritable, which it generally is in Cholera, (who could have "doubted it?) the saline effervescing draughts are of great "value; and I feel confident that the mortality from this "disease would be greatly lessened, even if we were to "trust, almost entirely, to this simple remedy."†

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he prepared the carbon in the presence of his patient, using certain forms and ceremonies, which, although ridiculous in themselves, were not altogether without benefit, as, however we may laugh at his ceremonies and incantations, it was allowed, by all who have given us any particulars respecting him, that he lost few or no patients by this method of treatment. The true charm consisted in the preparation of the remedy at the moment of its administration; for, as was before remarked, carbon, when recent, possesses properties which it loses by age.

* Sep. 29th, 1832. † Medical Gazette, August 25th, 1832.

In answer to some observations which were made in a newspaper of Barcelona, relative to the effect of Carbonic acid in one particular case, the attendant Physicians, Dr. Ardevol, Dr. Frau, (Professor of Anatomy and Surgery,) and Dr. Sauch, (Physician to the General Hospital,) the first individuals in that town, who adopted the plan of treatment here pointed out, express themselves in these terms:—"The Spanish physicians, resident in Barcelona, "who had the honour of meeting Mr. Parkin, admitted "from the beginning, with cordial assent, the opinions of "this gentleman; since, although they were not entirely "ignorant of the good effects of carbonic acid gas, to this "English practitioner (whose name already belongs to his-"tory, adorned with the most grateful remembrance of "mankind) is to be ascribed the glory of having establish-"ed the administration of this medicine. This chemi-"cal agent is *a specific remedy* for the cure of the Asiatic "Cholera, in its first and second periods; adminis-"tered by skilful hands and with medical tact. We have "had the satisfaction of saving, with this remedy, do-"zens of individuals who were brought to the gates of "death."*

The former of these gentlemen, in a subsequent communication† and after a more extended trial, offers the following strong testimony to the efficacy of this remedy:—"The Carbonic acid gas is a chemical agent which posi-"tively neutralizes the morbific poison of Cholera. Its "effects are observable in the first, second, third, and "fourth periods of the disease. In that of the preliminary "diarrhœa, it modifies the morbid impression in a percep-"tible manner; changes the nature of the discharges, "giving rise to bilious secretions; and produces a speedy

* El Vapor, Oct. 1834. † El Catalan, No. 44. 13th November, 1834.

"alteration in the choleroid physiognomy of the patient, "who soon acquires his normal appearance."

"*The efficacy of this medicine,*" continues the writer, "*is most visible at the commencement of collapse,* when the "blueness appears, and when there is an alteration and "sinking of the voice. This medical metamorphosis ap- "pears most remarkable in such (otherwise) desperate "cases; since the physician observes with pleasure the "speedy effects of the neutralization of the poison, by the "disappearance of the anxiety; the recovery of the voice; "the animation of the physiognomy; the return of the "pulse; and the removal of the state of depression; and, "finally, remarks that the patient passes to the period of "reaction with a free development of the pulse, confirming "thereby the hopes of the sufferer for the re-establish- "ment of his health. In the algid state, with blueness, "loss of pulse, suppression of urine, and visible depres- "sion, if the patient preserves his intellectual faculties, its "good effects are also observable to all who have sight and "wish to see. And I will say, finally, that, in the actual "state of our knowledge, *the materia medica,* in this case, "*has no other agent which can replace it.*"*

This document, which I appreciate as the testimony of an individual for whose memory I shall always entertain the greatest respect, and to whom I was indebted for much valuable co-operation during my stay at Barcelona, will not fail to make an impression on the mind of every unprejudiced person, coming, as it does, from a gentleman of reputed talents in his profession, and who to his general

* The name of Dr. Ardevol must be familiar to many of the English surgeons stationed in Gibraltar during the prevalence of the yellow fever in that fortress. He died, I regret to add, of an affection of the heart, some months after the subsidence of the Epidemic—the event being hastened, in all probability, by the fatigue and exertion he underwent at that period.

experience, acquired in different parts of the world, added the advantage of having witnessed the fatal eruption of the Epidemic Cholera in the capital of France.

But it is to the medical practitioners of Mataro, the Brighton of Catalonia, that I am most indebted for the assistance they afforded to that cause in which I was then engaged. This will appear evident by the perusal of the following extract from an article inserted in one of the Medical Journals of Madrid, by Dr. Pascual.*

It commences thus:—

"The continued announcement of specific remedies for "counteracting the effects of this destructive disease; and "their inefficacy, inutility, and detriment in the hands of "the physician who has trusted to the unbounded praises "with which they have been enhanced, will, perhaps, cause "this new remedial agent to be viewed as another of the "numberless advertisements which have adorned the cor- "ners of the streets; filled the columns of the newspa- "pers; and, lastly, barbarously trafficked with the credulity "and ignorance of the vulgar, always easily beguiled and "never tutored by experience. Impressed with a convic- "tion of the necessity and obligation, by which the clinical "observer and historian is bound, to use the language "of sincerity and freedom; and impelled solely by a desire "to be useful to humanity and science, I am going to "present the result of the administration of Carbonic "acid gas in the Cholera Morbus of the town of Mataro, "from the 8th day of October to the 12th of December, "1834.

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* Boletin de Medicina y. Cirujia, No. 35, Jan. 29, 1835.

These documents, together with a copy of the Spanish, French, and Italian editions of this work, are lodged in the Library of the Royal College of Surgeons, London; where they will be open to the inspection of any individual who may wish to peruse them.

"In the first days of the appearance of the disease, all "the patients were treated with the method entirely anti- "phlogistic; but three or four persons of note, who were "subjected to this treatment, having perished, it lost credit, "and caused bleeding to be regarded as the passport to "the other world."

It was at this period that I placed myself in communication with the physicians of Mataro, who, having heard that the administration of carbonic acid had been attended with considerable success in Barcelona, were easily induced to try its effects in that town also. "This," continues the "narrator, "happened in the period of the ascent of the "disease. But what was our pleasing surprise, when we "really saw all the patients, who summoned us before the "state of collapse became developed, change, *as by enchant- "ment*, their morbid condition, under the immediate in- "fluence of the gas! You may be assured, gentlemen, "that I do not magnify the facts: but it is necessary to "have seen the effect in order to believe it. The several "practitioners mutually recounted to each other the pleas- "ing change which, with satisfaction, they observed in the "sick; so that we were able to prognosticate, with all the "probability of which the science of medicine is suscep- "tible, that a patient who took carbonic acid, before the "period of asphyxia, generally recovered speedily and "securely.

"The most immediate effects which I have constantly "observed, from the introduction of the gas into the sto- "mach, have been the following:—If the patient is labour- "ing under suspicious diarrhœa; loud rumbling of the "bowels; small pulse; slight alteration in the physiogno- "my and voice somewhat changed,—the third dose usually "suspends altogether the diarrhœa, and the other symp- "toms disappear successively—the course of the disease

"consequently, being arrested. If the patient has that "continued mortal oppression at the præcordia, with burn- "ing heat in the epigastric region; vomitings and rice- "water evacuations; remarkable alteration in the physi- "ognomy; without having altogether lost the temperature "of the extremities; it may be said that *the carbonic acid*, "in these cases, *acts miraculously*. At the third or fourth "dose, the patient experiences a calm and indescribable "ease, which makes him exclaim, with all the vehemence "imaginable, '*Give me more of this draught, for it restores* "*me to life.*' Truly it was surprising to see the rapid "amendment of a patient, a little while before in so dan- "gerous a state. The purging either ceased, or was con- "verted from albuminous into excrementitious; the voice, "the pulse, the physiognomy, recovered themselves re- "markably, and the Physician inwardly rejoiced at the "promptitude, security, and gentleness with which he had "just snatched from the jaws of death an idolized father, a "beloved son, or a mother surrounded with presumptive "orphans.

"Do not suppose, gentlemen, that I overcharge, in any "respect, this medical recital. Fourteen practitioners (the "whole in the town) would, I am certain, put their signa- "tures to any testimonial which might be required from "them. Persons of the first rank in this city proclaim "openly the advantages which they experienced from this "remedy; and I, also, should consider myself unworthy of "the noble profession which I exercise, if I had been ca- "pable of distorting, in the least, a relation, whose object "is no less than the good of humanity, and the advance- "ment of medical science. All the objections which can "be made against the especial efficacy of carbonic acid, in "the Cholera Morbus of this city, are thrown down at the "feet of the appreciable multitude of practical facts that I,

"the other practitioners, and, in particular, Dr. Rabasa, "physician to the hospital, have collected, unless it should "be proved that we have not seen that which we have "seen."

In addition to this document, written by Dr. Pascual, at the request and with the approbation of the other practitioners of Mataro, another report was also sent by these gentlemen to the Supreme Board of Health, and to the same purport. Two other very strong reports were also drawn up, by the several practitioners of the towns of Salamanca and Ballecas, in favour of this remedy, but I was unable to obtain copies of them previous to my departure from Madrid, as they had been mislaid, or abstracted from the Archives of the Academy of Medicine in Madrid, by some individual, and thus rendered useless both to me and others.

Although the Cholera has only prevailed in Spain once since the above period, in a few towns in the north of Catalonia, I have been gratified by learning that Carbonic acid gas was employed in one of them, and with its usual success; as may be gleaned from the following extract of a letter inserted in the *Vapor* newspaper of Barcelona, Oct. 1835 :—"The plan of treatment recommended by Dr. "Parkin, whose treatise I obtained, out of mere curiosity, "when I was in Barcelona, has effected wonders, since it "has cured *all* with whom it has been tried. Would to "God," exclaims the writer, "that it had been adopted, "even by one of our physicians, at the commencement of "the disease, to the same extent as was the case afterwards, "for we should then, most assuredly, have had no victims."

SINCE the publication of my former work on the CHOLERA, the following report, which I was unable to obtain at the time, has been forwarded to me. As it emanates from a public body, similar to the College of Physicians and Surgeons in England, or the Faculty of Medicine in Edinburgh, and was drawn up by the express order of government, it necessarily becomes a most important and valuable document; for, although it might be supposed that private individuals were swayed by personal feelings and prejudices, no one could imagine that a body of men, thus constituted and thus appointed, could be influenced by such motives, particularly as the opinions there expressed were not only those entertained by the members of the commission themselves, but were also in accordance with the reports sent in by a variety of practitioners.

REPORT of the Commission appointed by the Royal Academy of Medicine and Surgery in Barcelona, agreeably to the order of the Supreme Board of Medicine and Surgery in Spain, that it should make known what plan of Treatment had produced the best effects, in the Epidemic Cholera, in those Towns situated in the districts under the jurisdiction of the Academy and which had been attacked by the disease.

After a few introductory remarks, as to the nature of the duties which the commissioners had to perform; their obligations; the contradictory accounts that had been given respecting various remedies, and the failure of those that had been most vaunted, the report thus proceeds:—

"After the first cases which presented themselves, the following plans of treatment were adopted: general and local bleeding; abstinence from all solids—the patient's diet being reduced to only toast and water, or rice-water—

the external and internal application of refrigerants; sudorifics; antispasmodics, and opiates; hot and vapour baths; the powders of vivorera (of Murcia) so strongly recommended; water acidulated with sulphuric acid, named, *par excellence*, the anti-cholera mixture; derivatives and blisters, varied in a thousand ways; the moxa; cupping; the sulphate of quinine, in large and gradually increased doses, both in powder and in solution; frictions of various kinds, and other agents which increase the heat of the body; camphor; musk; ipecacuanha; oil of olives; the sulphate of copper and iron; the oxide of bismuth; the aristolochia, etc. But, what cause for lamentation! *nearly all the patients that had the disease at all severely perished*—notwithstanding that, in the employment of the above means, the requisite attention was paid to the state of the patient, so as to determine the proper occasion for their administration, and which is necessary with every remedy."

"This truth, lamentable as it is, the commissioners have had the sorrow to experience; but they hope to lessen its bitterness, by submitting to the judgment of the Academy a plan of treatment which, according to their ideas, in addition to being the most appropriate, *offers great simplicity*, and is the same, with a slight difference, which many practitioners have adopted with *the most happy results*, according to the official communications made to the Academy." [After drawing a distinction between the bilious diarrhœas which prevailed at the same time, and which were found to yield to the ordinary plans of treatment, the writers add, that the indication was entirely changed when the excretions were composed of the true choleric fluid; and when, in addition to the rice-water evacuations, similar to those of dropsical patients, there was an alteration of the physiognomy, and a certain morbid condition of the surface of the body (blueness), which is common to all in

that state, in spite of the number or diminution of the other symptoms.] "*When this is the case* (*i. e.*, when collapse has supervened), *the employment of Carbonic acid gas produces wonderful effects*—administered according to the method of Dr. John Parkin (an honorary fellow of this Academy), either in combination with water, or, as you may say, by forming the gaseous acidulated waters, obtained by the decomposition of the bi-carbonates of potash or soda, by means of the citric or tartaric acids. This treatment should be continued even in the state of complete and confirmed collapse, on account of its being *the most efficacious and direct of all the plans that have been tried*—and it is certain that, if it is used at the commencement, and the patients do not neglect to call the medical attendant, after the disease has once manifested itself, *there will be few who come to this state of atrophy and wretchedness.* As auxiliaries, blisters may be employed, and enemas of starch or linseed, and, for the cramps, frictions with common oil, either with or without laudanum; or, what is better, with assafœtida and camphor dissolved in vinegar." After a few more cursory remarks on some unimportant subjects, as the allowance of cold water, the treatment of the febrile stage, etc., the writers conclude their report in these words:—"The commission, in giving this opinion, has endeavoured, *without any other object than the truth and the future progress of science*, to reject every doubtful and fanciful theory, which leads only to error, and which might be perpetuated, if, through delicacy and ill-judged consideration, it had remained silent. The commission has made it a duty to conform entirely to this fundamental axiom, that facts, well attested and separated from all theory, are, in the treatment of disease, the only durable acquisitions."

Signed:

JUAN FRANCISCO DE BAHI, *President.*

"The above document was remitted, in the name of the Academy, to the proper authorities, who approved of the report in all its parts, and of the opinions given by the commission, especially named by them, and of which I was secretary." B. Sauch.

In a note which I received, at the same time, from Dr. Sauch, the then medical secretary to the Academy, the writer says, in answer to some inquiries of mine on a particular point, "it is impossible now to ascertain the proportion of cases of collapse, on account of the little regularity observed by the different writers in their communications to the Academy—but it is clearly deducible from the above report that there were plenty, since, at the commencement of the epidemic, nearly all the patients attacked with cholera died. I can also assure you, that I attended a great many patients in a state of *confirmed collapse*, whose recovery was entirely due to the administration of Carbonic acid gas. In fact, from what I then saw in my private practice, somewhat extensive, I can affirm that the treatment of the cholera with Carbonic acid is truly scientific; the gas in this case is the *real antidote to the disease*, and, consequently, the supporter of life. Up to the present time it is *the only therapeutic agent* which, taken scientifically, is capable of destroying the organic lesion, by directly changing the morbific action which produces the cholera. Such admirable results we may in vain expect to obtain from any of the other methods which have been adopted, the whole of them being, more or less, unsuitable or useless."

H. W. MARTIN, *Printer*, 19, Cursitor Street, Chancery Lane.

ALSO BY THE SAME AUTHOR,

Published by HATCHARD & SON, Piccadilly, Price 7s. 6d.,

An Enquiry

INTO THE REMOTE CAUSE

OF

EPIDEMIC DISEASES.

BEING AN ATTEMPT TO EXPLAIN THE PRIMARY CAUSE OF THE PRODUCTION OF SUCH MALADIES IN THE HUMAN RACE AND THE BRUTE CREATION—AS WELL AS TO POINT OUT THE CONNECTION WHICH EXISTS BETWEEN THESE DISEASES, THE BLIGHTS IN THE VEGETABLE KINGDOM, AND CERTAIN ATMOSPHERICAL PHENOMENA, OR VICISSITUDES, THAT OCCUR AT EPIDEMIC AND OTHER PERIODS.

Notices of the Press.

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